

DRO-550 Enclosure Construction

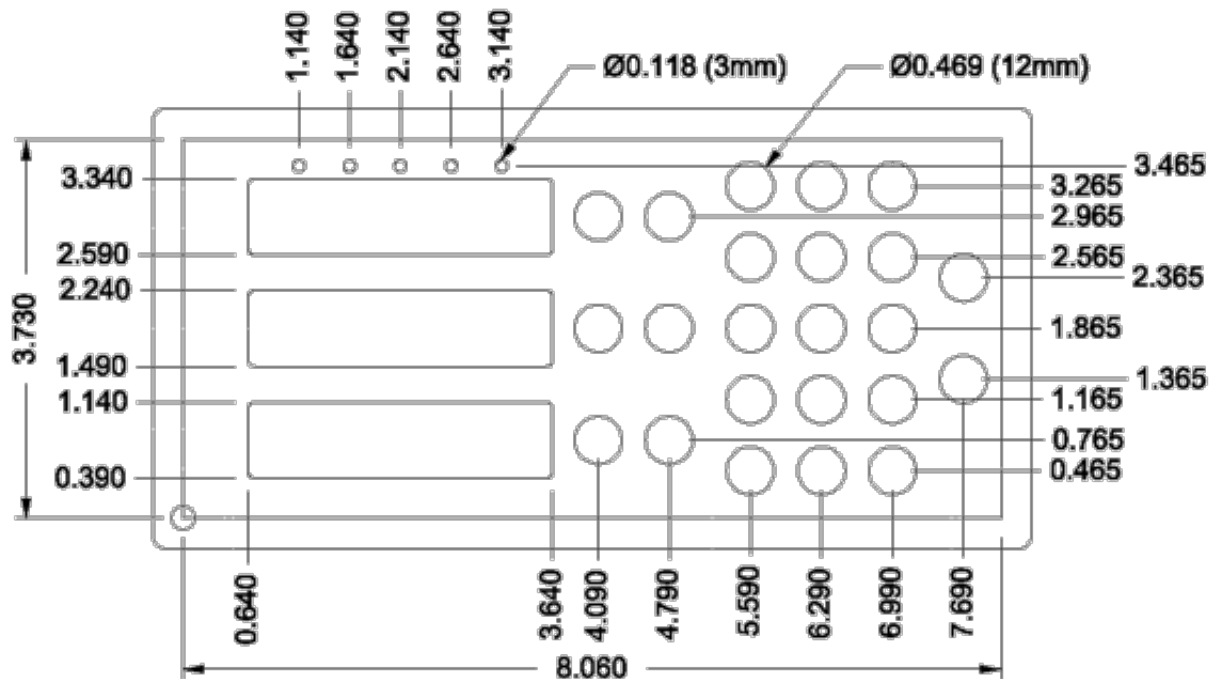


Step 1. Machine the Front Panel

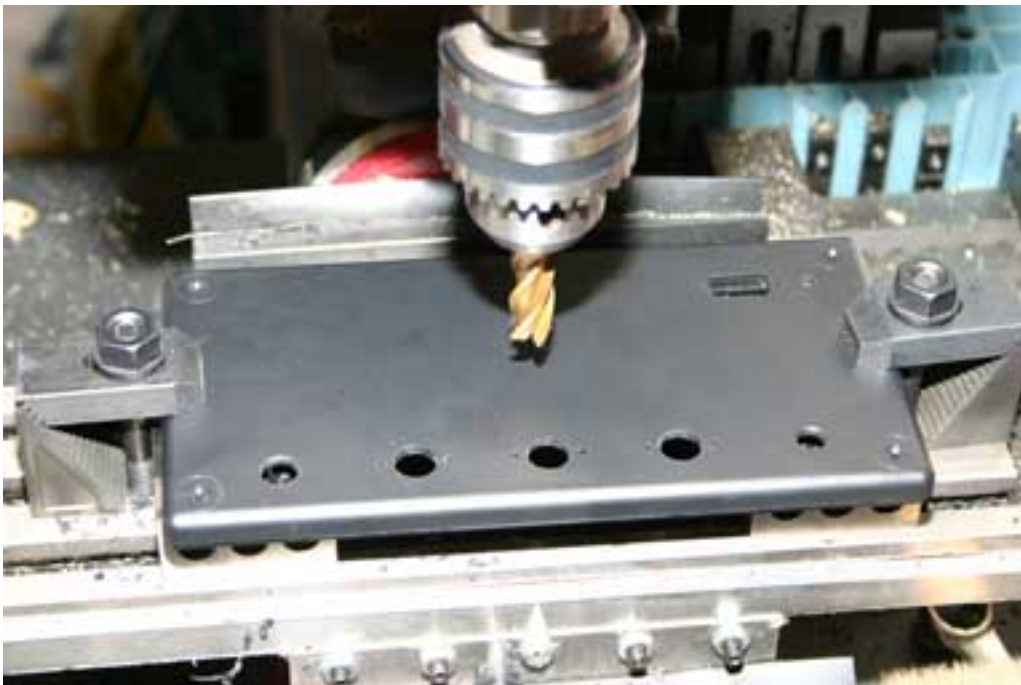
The enclosure is machined using standard milling and drilling operations. Note that when cutting plastic, you should use a fairly high RPM and use a slow feed while drilling or use a wood block or something behind the front panel. The enclosure is made of ABS plastic so use as fast an RPM as possible without melting the plastic.

None of the drill holes in the drawing are critical. You can do fine using the closet nominal drill size that is greater than the called-out diameter. For example, the 0.469 (12mm) diameter called out for the tact switch buttons can be drilled with a 1/2" diameter drill bit. The overlay will cover up any overage or mistakes so don't worry about precision here.

For the display cut-outs, use an 1/8" or so end mill, either two or four flute. The following figure is a dimensioned drawing of the front of the enclosure.



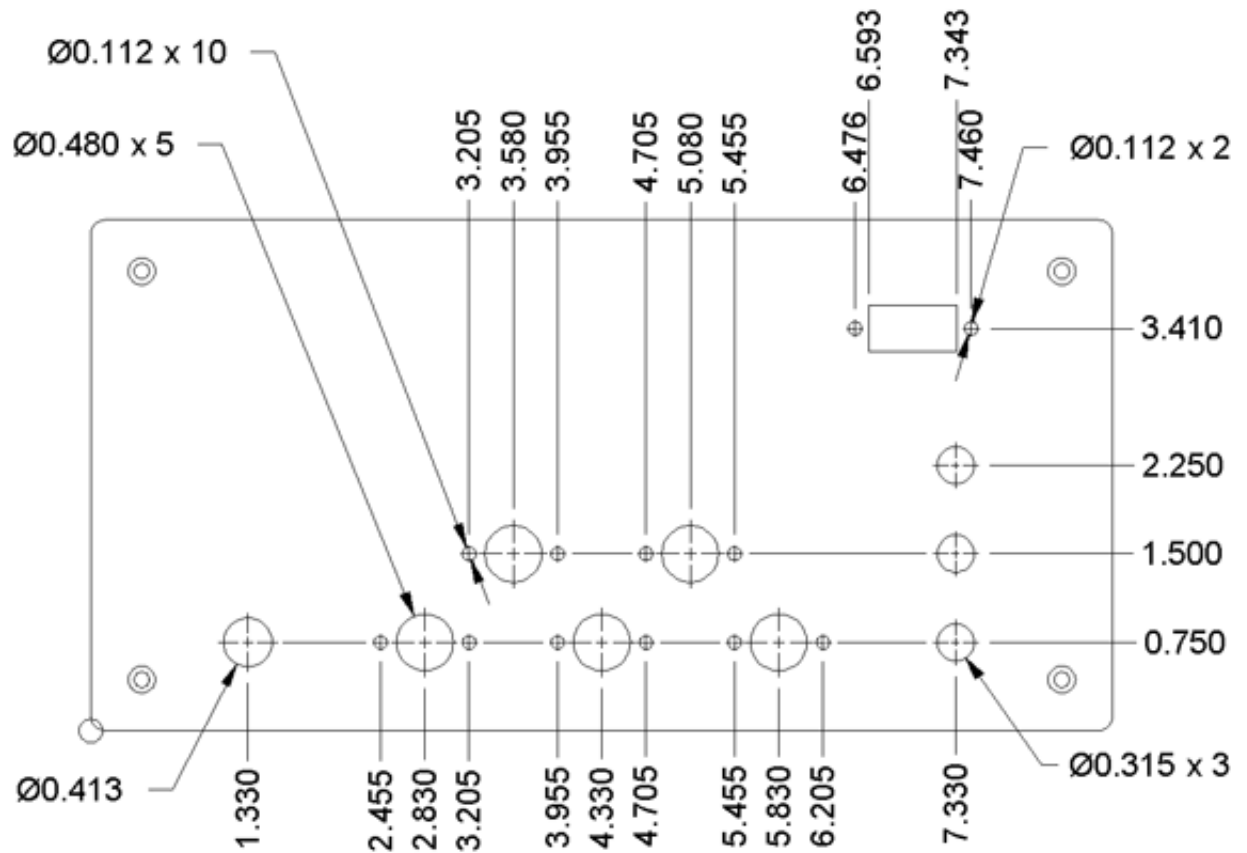
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Step 2. Machine the Rear Panel

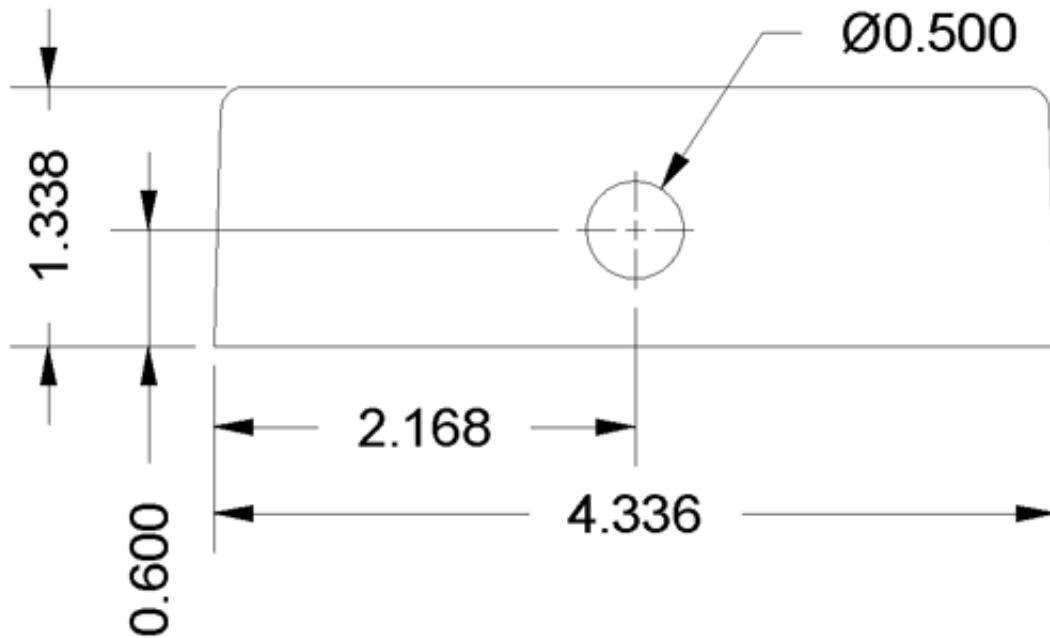
The layout of the rear panel is not at all critical and you can machine it however you like. The drawing below shows one possible layout for the rear panel. This layout is based on the DRO-350 rear panel so if

you already have a DRO-350 case with the original layout, then you can just add the extra connector holes that you need. Just be careful to stay away from the standoffs that are on the inside.



Step 3. Drill the USB Hole

The USB interface is used to both program the DRO-550 and to interface the DRO with a PC to control its functions. The hole for the USB exits the case on the keypad side of the front panel. This is the right side when viewing the DRO from the front. Drill a hole for the USB connector at the position shown in the drawing below.



Step 4. Install the Standoffs

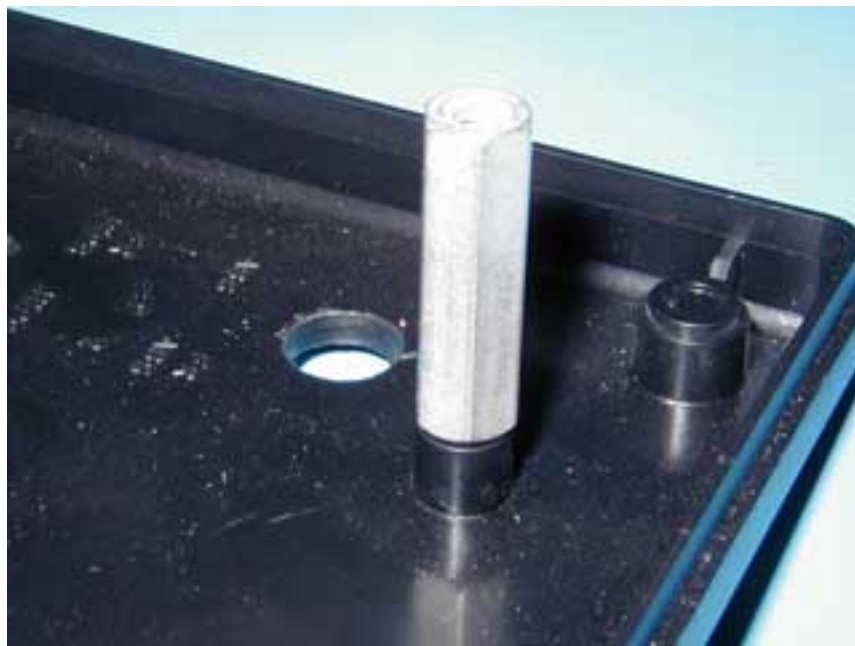
The standoffs are mounted to the back panel of the enclosure and attach to the component side of the PCB with the seven segment displays and tact switches facing out. The six plastic posts in the back panel must be tapped 6-32 to hold the standoffs. You should use a small hand tap with a gentle touch. Be careful to stop as soon as the front of the tap hits the bottom of the post hole otherwise you will strip the threads. If you do, don't worry since you can just epoxy the standoffs in place just as well.

The hex standoffs are made of aluminum and have a 6-32 male thread on one end and a 6-32 female thread on the other end. The male thread is slightly too long for the plastic posts so you must grind or cut about



1/16" from the end.

Install the six hex standoffs in the tapped posts. I would recommend tightening them firmly by hand. If you use a tool, be careful not to strip the threads.





Step 5. Install the Connectors

The scale connectors are 4 pin mini-DIN type that mount to the back panel with 4-40 x 1/2" black machine screws. You can install up to five scale connectors with the DRO-550. The connectors listed in the bill of materials have a hole on either side that must be tapped 4-40 before mounting with the screws. This is most easily done with a small hand tap.

After tapping, mount the scale connectors to the back panel with the 4-40 x 1/2" screws.



The edge finder and tachometer connectors are 3.5mm stereo jacks. The DRO-550 supports up to two of each. Remove the nuts included with the connectors and mount them on the rear panel. If MTA plugs are

used on the other end of the cables, then they must not be installed until after the stereo jacks are installed because the MTA plugs will not fit through the hole for the stereo jack. Solder the wires to the stereo jack as shown in the [cable construction page](#).



The DC power connector is a standard 2.1mm type. The connector listed in the bill of materials is a snap-in type that is simply pushed into the hole drilled into the back panel. Depending on the tolerances of the hole, you may need to put a few drops of hot glue or epoxy to assure that the connector does not pull out of the hole when the power cord is removed.





Step 6. Attach Overlay

The overlays are silk-screened onto the back of transparent 10mil Lexan film. They are screened with three colors: black, white, and a near-cyan color. The windows for the seven segment LED displays and the indicator LEDs above them are water clear. There are two types of overlays, one with X, Y, and Z designations for mills and one with X, Z1, and Z2 designations for lathes.

The overlays are best installed by masking the front of the completed enclosure with masking tape and spraying on a layer of adhesive such as Super77 onto the front of the enclosure. The overlay can then be pressed into place onto the front of the enclosure. **IMPORTANT:** Do not forget to remove the plastic protective film on the front of the overlay. Otherwise, the transparent windows will be slightly opaque instead of crystal clear.